

WHAT IS CLAIMED IS:

1. A multi-mode bi-directional communications device, comprising
 - a diplexer including a high-pass filter, a first low-pass filter, and a second low-pass filter;
 - 5 downstream processing circuitry coupled to the high-pass filter; and upstream processing circuitry selectively coupled to the first low-pass filter and the second low-pass filter.
2. The device of claim 1, wherein the downstream processing circuitry comprises:
 - 10 a tuner;
 - a demodulator;
 - a first SAW filter selectively coupled between said tuner and said demodulator;
 - and
 - a second SAW filter selectively coupled between said tuner and said demodulator.
3. The device of claim 2 wherein the first SAW filter has a bandwidth of 6MHz and the second SAW filter has a bandwidth of 8MHz.
- 20 4. The device of claim 2 further comprising at least one first selector for selectively coupling the first SAW filter and the second SAW filter between the tuner and the demodulator.
5. The device of claim 1 wherein said high-pass filter passes signals greater than 25 88MHz.
6. The device of claim 1 wherein the first low-pass filter passes signals less than 65MHz and the second low-pass filter passes signals less than 42MHz.
- 30 7. The device of claim 1 further comprising at least one second selector for selectively coupling the first low-pass filter and the second low-pass filter to the upstream processing circuitry.

8. The device of claim 1, wherein said device is a cable modem.

9. The device of claim 1, wherein said device supports multiple standards selected from
5 the group consisting of the North American Data Over Cable Service Interface
Specifications (DOCSIS) or the European DOCSIS standards.

10. A diplexer, comprising;
a high-pass filter coupled between a first signal port and a second signal port;
10 a first low-pass filter coupled between said first signal port and a third signal
port; and
a second low-pass filter coupled between said first signal port and said third
signal port.

15 11. The diplexer of claim 10, further comprising at least one selector for selectively
coupling at least the first low-pass filter or the second low-pass filter between said first
and third signal ports.

12. The diplexer of claim 11, wherein the at least one selector comprises a switch
20 selected from the group consisting of transistors, diodes, electro-mechanical and
mechanical switches.

13. The diplexer of claim 10, wherein each of said first and second low-pass filters
comprise:
25 a plurality of inductors connected in series between said first and third signal
ports, each of said inductors being coupled to ground via a respective capacitor forming
thereby a plurality of single pole filter elements, a portion of said inductors being
bypassed by respective capacitors.

14. The diplexer of claim 10, wherein said high-pass filter comprises:

- a plurality of capacitors connected in series between said first and second signal ports, each of said capacitors being coupled to ground via serially coupled circuit elements forming thereby a plurality of single pole filter elements, each of said serially coupled circuit elements comprising a capacitor and inductor.

15. A method of passing bi-directional communications signals of differing modes through a diplexer having a high-pass filter coupled between a first and a second signal port, a first and a second low-pass filter selectively coupled between the first and a third signal port, comprising:

- receiving downstream signals at the first signal port;
- filtering the received downstream signals using said high-pass filter;
- communicating filtered downstream signals to the second signal port;
- receiving upstream signals at the third signal port;
- selecting one of the first or second low-pass filters for filtering said received upstream signals in response to a desired communications mode; and
- sending the filtered signals to the first signal port.

10
5
15